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Perceptions of Classroom Environment, Achievement Goals, and Achievement Outcomes

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Two studies examined the relationship between undergraduates' perceptions of their classroom environment, their adoption of achievement goals for the course, and their graded performance and intrinsic motivation. Results revealed a distinct antecedent profile for each goal in the trichotomous framework: Mastery goals were linked to the presence of lecture engagement and the absence of an evaluation focus and harsh evaluation, performance-approach goals were linked to the presence of evaluation focus, and performance-avoidance goals were linked to the presence of evaluation focus and harsh evaluation. When the perceived classroom environment and achievement goal variables were tested together as predictors of graded performance and intrinsic motivation, the results clearly demonstrated that the influence of the perceived classroom environment on these outcomes measures was indirect; the perceived classroom environment influenced achievement goal adoption, and achievement goal adoption, in turn, directly influenced graded performance and intrinsic motivation.

Achievement goals are widely recognized as important constructs in understanding behavior in educational settings (Dweck, 1986; Nicholls, 1984). The central role of achievement goals as predictors of educationally relevant outcomes has been documented in a host of studies over the past 15 years (for reviews see Ames, 1992; Dweck, 1990; Harackiewicz, Barron, & Elliot, 1998; Pintrich, 1999; Urdan, 1997). Traditionally, achievement goal theorists have identified two distinct achievement goal orientations: *mastery goals,* which are focused on the development of competence and task mastery, and *performance goals,* which are focused on the demonstration of competence relative to others. Mastery goals are hypothesized to lead to persistence in the face of difficulty, challenge seeking, and intrinsic motivation; whereas performance goals are presumed to be associated with a constellation of negative outcomes such as minimal persistence in the face of failure, challenge avoidance, and low intrinsic motivation (Ames, 1992; Dweck, 1986; Nicholls, 1984).

Elliot and his colleagues have recently proposed a trichotomous achievement goal framework that represents a revision of the mastery/performance goal dichotomy (see Elliot & Church, 1997; Elliot & Harackiewicz, 1996). In this framework, performance goals are differentiated in terms of approach and avoidance, and three independent achievement goals are identified: (a) *mastery* goals that focus on the development of competence and task mastery, (b) *performance-approach* goals that focus on the attainment of favorable judgments of competence, and (c) *performance-avoidance* goals that focus on avoiding unfavorable judgments of competence. In the past few years, evidence has accumulated attesting to the utility of the trichotomous framework in accounting for a variety of educationally relevant outcomes (see Elliot & Church, 1997; Elliot & Harackiewicz, 1996; Elliot & McGregor, 1999; Elliot, McGregor, & Gable, 1999; Middleton & Midgley, 1997; Rawsthorne & Elliot, 1999; Skaalvik, 1997; Vandewalle, 1997; see Elliot, 1999, for a review). For example, Elliot and Church (1997) found that for undergraduates in an introductory-level psychology class, mastery goals led to high intrinsic motivation, performance-approach goals led to high graded performance, and performance-avoidance goals led to low intrinsic motivation and low graded performance.

Given that mastery, performance-approach, and performance-avoidance goals are differential predictors of important outcomes in educational settings, researchers must attend to the issue of what leads individuals to adopt each type of goal. To date, empirical work on antecedents of the three goals has focused exclusively on the following variables: implicit and self-attributed motives, implicit theories, and competence expectancies (Elliot & Church, 1997; Elliot & McGregor, 1999; Vandewalle, 1997). For example, in the Elliot and Church study, mastery goal adoption was predicted by need for achievement and high competence expectancies; performance-approach goal adoption was predicted by need for achievement, fear of failure, and high competence expectancies; and performance-avoidance goal adoption was predicted by fear of failure and low competence expectancies. In the present research, we sought to extend the research on antecedents of mastery, performance-approach, and performance-avoidance goals to include students' perceptions of the classroom environment.

Although research has yet to be conducted on classroom environment variables as antecedents of goals in the trichotomous framework, during the past decade this issue has received significant conceptual and empirical attention from researchers working with the dichotomous mastery/performance framework. Ames

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(1992) used a conceptual system labeled *TARGET* (developed by Epstein, 1988) to organize the numerous classroom characteristics presumed to orient students toward the adoption of mastery and performance goals. (TARGET is an acronym representing the following broad categories: *T*ask, *A*uthority, *R*ecognition, *G*rouping, *E*valuation, *T*ime; see Ames, 1992, for details.) Some research efforts emanating from the TARGET system have focused on the predictive role of individual classroom/school-wide characteristics, whereas others have combined several characteristics together to form composite indicators of classroom/school-wide mastery and performance goal structures. The empirical yield from these efforts has strongly supported hypothesized links between classroom/school-wide characteristics and mastery and performance goal adoption (Ames & Archer, 1988; L. Anderman & E. Anderman, 1999; E. Anderman & Midgley, 1997; E. Anderman & Young, 1994; Midgley, Anderman, & Hicks, 1995; Nolen & Haladyna, 1990; Pintrich, Roeser, & DeGroot, 1994; Roeser, Midgley, & Urdan, 1996; Young, 1997). It is important to note that theoretical and empirical work in this area highlights students' perceptions of their classroom/school-wide environment rather than the objective environment itself, because it is students' perceptions (i.e., the "psychological environment") that are presumed to play the more important role in the goal adoption process (Ames, 1992; Maehr & Midgley, 1991).

In the present research, we examined the role of several perceived classroom environment variables as antecedents of mastery, performance-approach, and performance-avoidance achievement goals. Specifically, we examined the TARGET literature with an eye toward classroom characteristics that might be directly applicable and differentially related to the adoption of each of the goals in the trichotomous framework. We selected the following variables as the primary focus of our investigation: lecture engagement (from the *T*ask category), evaluation focus (from the *E*valuation category), and harsh evaluation (from the *R*ecognition and *E*valuation categories). In accord with theoretical and empirical convention, we focused on students' perceptions of the classroom environment, rather than on the objective classroom environment itself.

Lecture engagement concerns the extent to which students perceive that the professor makes the lecture material interesting. Lectures that students find interesting and engaging are likely to facilitate absorption and "flow" and draw the student into the learning process (Brophy, 1986). As such, lecture engagement should promote the adoption of mastery goals; lecture engagement is expected to be unrelated to performance-approach and performance-avoidance goal adoption.

Evaluation focus concerns the degree to which students perceive that the professor emphasizes the importance of grades and performance evaluation in the course. A strong emphasis on evaluation is likely to orient students toward performance outcomes (Ames & Archer, 1988; Maehr & Midgley, 1991), which should prompt the adoption of performance goals, both approach and avoidance. The emphasis on external evaluation is also likely to discourage mastery pursuits (Ames, 1992; Meece, 1991), and thus be negatively related to mastery goal adoption.

Harsh evaluation concerns the extent to which students view the grading structure as so difficult that it minimizes the likelihood of successful performance. This form of evaluation is likely to make salient the possibility of a negative performance outcome (Elliot & Harackiewicz, 1996; Stipek, 1996), thereby prompting performance-avoidance goals. Harsh evaluation is also likely to evoke anxiety (Elliot, 1997), which is expected to reduce the likelihood of mastery goal adoption. Minimizing the availability of a positive outcome is likely to be negatively, or at minimum unrelated, to performance-approach goal adoption.

An additional aim of the present research was to investigate the perceived classroom environment as a distal predictor and achievement goals as a proximal predictor of two important achievement outcomes: graded performance and intrinsic motivation. We view the classroom environment as exerting an indirect, distal effect on achievement outcomes by their influence on achievement goal adoption; achievement goals, in turn, are presumed to be the direct, proximal predictors of achievement outcomes. That is, individuals' perceptions of the classroom environment (or any achievement setting) are presumed to evoke various desires and concerns that are channelled in a specific direction through the adoption of achievement goals. The goals individuals adopt are used in daily self-regulation within the classroom setting and, therefore, are likely to directly affect the way the person thinks, feels, and performs in that setting. This perspective is highly consistent with Midgley and colleagues' (Midgley et al., 1995; Roeser et al., 1996) view of achievement goals as mediational mechanisms and their research demonstrating that students' achievement goals mediate the relationship between school-wide goal structures and academic self-efficacy and self-consciousness. More generally, the hierarchical structuring of perceived classroom environment variables and achievement goals is consistent with Elliot and Church's (1997) proposal that achievement motives (and other intrapsychic variables, see Elliot, 1999) exert an indirect effect on achievement outcomes by evoking achievement goals that, in turn, serve the role of direct, proximal predictors.

Thus, in the present research we predicted that any effect of lecture engagement, evaluation focus, and harsh evaluation on graded performance and intrinsic motivation would occur through the achievement goal variables. On the basis of previous research, we hypothesized that the three achievement goals would be directly linked to the outcome measures as follows: mastery goals would be positively related to intrinsic motivation and unrelated to graded performance, performance-approach goals would be positively related to graded performance and unrelated to intrinsic motivation, and performance-avoidance goals would be negatively related to graded performance and intrinsic motivation (see Elliot & Church, 1997).

In summary, the present research examined the relationship between undergraduates' perceptions of their classroom environment, their adoption of achievement goals for the course, and their graded performance in the course and intrinsic motivation for the course material. In Study 1, we investigated the relationship between three perceived classroom environment variables—lecture engagement, evaluation focus, and harsh evaluation—and achievement goal adoption. In Study 2, we sought to replicate the Study 1 findings and to additionally investigate the role of the perceived classroom environment variables as distal predictors and achievement goals as proximal predictors of graded performance and intrinsic motivation. Study 2 also included additional variables designed to examine ancillary issues; these issues are introduced following the presentation of Study 1.

Study 1

Method

Participants and Course Information

One hundred and nineteen male and 89 female undergraduates enrolled in one of nine chemistry classes involved in the Workshop Chemistry Program (Gosser et al., 1996) participated in the study. The aim of the Workshop Chemistry Program is to redesign traditional chemistry courses to create a more positive experience for students, thus improving learning and student retention in college-level chemistry courses. In the program, classes are conducted in lecture format, but are supported by weekly discussion groups. All classes in this study also utilized an absolute (e.g., 90% = A, 80% = B) as opposed to normative (i.e., statistically curved) grading structure (the mean class size was 32, with a range of 20–42). Students' participation in the study was voluntary (88.5% of eligible individuals participated), and the mean age of participants was approximately 20.5 years old (ranging from 17 to ≥ 26). Approximately 45% of the sample was Caucasian, with the remainder about an even distribution of African Americans, Latinos, Asians, and those designating themselves "other."

Procedure

The assessments were administered one to two classes before the first exam to ensure that students had been given the opportunity to form an impression of the classroom environment, but had not been influenced by any performance feedback. Participants' perceptions of the classroom environment were assessed first, followed by the assessment of several variables applicable to another research project, and then the achievement goals measure was presented.

Measures

Perceived classroom environment. Pilot testing was conducted to create measures to assess the perceived classroom environment variables of central interest: lecture engagement, evaluation focus, and harsh evaluation. The initial item pool consisted of revised items from existing classroom or sport climate scales (Ames & Archer, 1988; Frasier & Fisher, 1986; Winston et al., 1994), as well as new items generated for the present research. On the basis of results from the pilot testing, we constructed four-item measures of lecture engagement ("I find the lectures to be very engaging," "The way that the professor helps us learn the material holds my interest," "The professor presents the material in an interesting manner," and "I find the lectures boring" [reversed]) and harsh evaluation ("The grading for this course is pretty harsh," "The grading structure makes it almost impossible to get an A in this course," "High grades are seldom obtained by students in this course," and "The grading in this class is pretty easy" [reversed]) and a three-item measure of evaluation focus ("The focus of this course seems to be more on evaluating us than on teaching us," "The professor is more concerned with our grades than what we learn," and "It seems like all the professor cares about is how we do on the exams") for use in the present research (see Table 1 for reliabilities). Participants indicated their response to each item on a 1 (*strongly diagree*) to 7 (*strongly agree*) scale.

The Study 1 data were submitted to a principal-components factor analysis with varimax rotation. This analysis validated the presence of the three hypothesized perceived classroom environment factors because each item loaded on its designated factor, all items loaded higher than .40 on their primary factor, and there were no crossloaders (the minimum difference between the primary and secondary loadings for any factor was .35). The three factors—lecture engagement (eigenvalue = 4.67), evaluation focus (eigenvalue = 1.50), and harsh evaluation (eigenvalue = 1.27)—accounted for 67.5% of the total variance.

Achievement goals. Elliot and Church's (1997) 18-item achievement goals questionnaire was used to assess students' adoption of mastery, performance-approach, and performance-avoidance goals for the course. This questionnaire contains 6 items for each of the goals, and participants are asked to rate the degree to which each item applies to them on a 1 (*not at all true of me*) to 7 (*very true of me*) scale. The reliability and validity of the questionnaire have been demonstrated in several previous studies (see Elliot, 1997, 1999).

Results

Overview of Analyses

The hypotheses were tested using hierarchical linear modeling (HLM; Bryk & Raudenbush, 1992). HLM is a multilevel random coefficient regression-based technique that permits simultaneous analyses of within-class and between-class sources of variance. This study was designed to examine within-class rather than between-class effects. (The examination of between-class effects would have required a larger sample of classrooms than those involved in the Workshop Chemistry Project.) As such, HLM was used for the purpose of examining the within-class effects while separating out (i.e., controlling for) variance at the between-class level. The data were represented by a two-level model with students nested within classrooms. In each analysis, the predictor variables were group-mean centered. (Ancillary analyses in which the predictor variables were grand-mean centered produced the same results.) All results are reported in terms of unstandardized raw-score coefficients.

Two approaches were used to examine the hypotheses. First, HLM equations were constructed that tested each perceived class-

Table 1
Study 1: Descriptive Statistics and Intercorrelations Among the Primary Variables

Variable	*M*	*SD*	Observed range	Reliability	Variable 1	2	3	4	5	6
1. Lecture engagement	18.68	7.21	4–28	.91	—					
2. Evaluation focus	7.41	3.77	3–21	.65	−.40**	—				
3. Harsh evaluation	15.58	5.60	4–28	.74	−.46**	.39**	—			
4. Mastery goals	35.74	5.35	8–42	.75	.33**	−.22**	−.20**	—		
5. Performance-approach goals	27.16	9.19	6–42	.86	.00	.21**	.10	.24**	—	
6. Performance-avoidance goals	28.25	7.72	6–42	.70	−.17*	.22**	.30**	.07	.35**	—

* $p < .05$. ** $p < .01$.

room environment variable separately as a predictor of each achievement goal. For example, the equation used to examine lecture engagement as a predictor of mastery goals was as follows: $Y_{ij} = \beta_{0j} + \beta_{1j}$ (lecture engagement) + error; $\beta_{0j} = \gamma_{00} + u_{0j}$; $\beta_{1j} = \gamma_{10} + u_{1j}$. Second, additional HLM equations were constructed that simultaneously tested the perceived classroom environment variables as joint predictors of each achievement goal. For example, the equation used to examine the three perceived classroom environment variables as joint predictors of mastery goals was as follows: $Y_{ij} = \beta_{0j} + \beta_{1j}$ (lecture engagement) + β_{2j} (evaluation focus) + β_{3j} (harsh evaluation) + error; $\beta_{0j} = \gamma_{00} + u_{0j}$, $\beta_{1j} = \gamma_{10} + u_{1j}$, $\beta_{2j} = \gamma_{20} + u_{2j}$; $\beta_{3j} = \gamma_{30} + u_{3j}$. Given that students' perceptions of the classroom environment undoubtedly operate in concert, rather than in isolation, to influence achievement goal adoption, this second set of analyses may more accurately represent the processes under consideration. Sex was examined as a predictor variable in preliminary analyses and was retained in the final analyses when significant. Descriptive statistics, reliabilities, and zero-order correlations for the primary variables in the study are presented in Table 1.

Perceived Classroom Environment Variables as Predictors of Achievement Goals

Mastery goals. Testing each perceived classroom environment variable as an individual predictor of mastery goals revealed a significant relationship for each perceived classroom environment variable. Lecture engagement was a positive predictor of mastery goals ($\gamma_{10} = .34, p < .05$), whereas evaluation focus ($\gamma_{10} = -.38, p < .05$) and harsh evaluation ($\gamma_{10} = -.23, p < .05$) were negative predictors. When the perceived classroom environment variables were tested together as joint predictors of mastery goals, lecture engagement remained a significant positive predictor ($\gamma_{10} = .29, p < .05$), whereas evaluation focus and harsh evaluation no longer attained significance.

Performance-approach goals. Testing each perceived classroom environment variable as an individual predictor of performance-approach goals yielded a single significant relationship: Evaluation focus was positively related to performance-approach goals ($\gamma_{10} = .50, p < .05$). When the perceived classroom environment variables were tested together as joint predictors of performance-approach goals, lecture evaluation focus remained a significant positive predictor ($\gamma_{20} = .64, p < .05$).

Performance-avoidance goals. Testing each perceived classroom environment variable as an individual predictor of performance-avoidance goals yielded a significant relationship for evaluation focus and harsh evaluation. Both variables were positive predictors of performance-avoidance goals ($\gamma_{10} = .44, p < .05$ and $\gamma_{10} = .35, p < .05$, respectively). When the perceived classroom environment variables were tested together as joint predictors of performance-avoidance goals, evaluation focus maintained a positive trend ($\gamma_{20} = .37, p = .10$) and harsh evaluation remained a significant predictor ($\gamma_{30} = .29, p < .05$).[1]

Discussion

The results of this study were consistent with our hypotheses. Lecture engagement was a positive predictor of mastery goal adoption, but did not influence the adoption of performance-approach or performance-avoidance goals. Evaluation focus was a positive predictor of both performance-approach and performance-avoidance goals, and a negative predictor of mastery goals. Harsh evaluation was a positive predictor of performance-avoidance goals and a negative predictor of mastery goals, and was unrelated to performance-approach goals. The only ambiguity to emerge from the results was that evaluation focus and harsh evaluation were both negative predictors of mastery goals in the individual, but not in the joint, analyses. Study 2 was an attempt to replicate and extend the Study 1 results. The procedure for Study 2 was essentially the same as in Study 1 in that we assessed undergraduates' perceptions of their classroom environment (lecture engagement, evaluation focus, and harsh evaluation) and examined these perceived classroom environment variables as predictors of mastery, performance-approach, and performance-avoidance goals. In Study 2 we also included measures of graded performance and intrinsic motivation to test our predictions regarding the distal role of the perceived classroom environment and the proximal role of achievement goals in predicting achievement outcomes. To reiterate, we view the perceived classroom environment as exerting an indirect effect on achievement outcomes through their influence on achievement goal adoption; achievement goals are seen as the direct predictors of achievement outcomes. Thus, we hypothesized that any effect of the perceived classroom environment variables on graded performance and intrinsic motivation would occur through their influence on the achievement goal variables.

Study 2 also addressed two ancillary issues. First, the study was conducted in two classrooms: one utilizing an absolute standard for evaluation, and the other using a normative standard for evaluation. The use of different evaluative standards in the two classes allowed us to examine evaluation type as a fourth antecedent variable. We predicted that the use of an absolute grading structure would encourage students to focus on learning and mastering the course content and foster mastery goal adoption and that the use of a normative grading structure would focus students on normative performance outcomes and thereby lead to performance-approach and performance-avoidance goal adoption.

Second, we assessed students' competence valuation—the extent to which they valued doing well in the class (Harackiewicz &

[1] Although the focus of this study is on within-class variance, the use of HLM procedures does allow an examination of between-class variance as well. Given the small sample of classes in this study, however, any between-class results should be interpreted with great caution. First, the ratio of between-class to total variance (between class plus within class) for each achievement goal was examined by constructing a fully unconditional model for each goal. For mastery and performance-approach goals, the amount of between-class variance was negligible—less than one percent of the total variance. For performance-avoidance goals, the ratio was 7.23, indicating that approximately 7% of the performance-avoidance goals variance was between classes.

Second, although objective aspects of the classroom environment were not measured, the mean levels of students' perceptions within classrooms may be used as a proxy. Mean classroom scores for lecture engagement, evaluation focus, and harsh evaluation were computed and HLM equations were constructed in which goals were predicted by these three variables (i.e., $Y_{ij} = \beta_{0j}$; $\beta_{0j} = \gamma_{00} + \gamma_{01}$ [average lecture engagement] + γ_{02} [average evaluation focus] + γ_{03} [average harsh evaluation]). No average classroom perception variables reached significance.

Manderlink, 1984)—and obtained students' SAT (Scholastic Aptitude Test) score information. Acquiring these data allowed us to examine the predictive utility of the perceived classroom environment and achievement goal variables independent of students' overall investment in competence and general level of ability.

Study 2

Method

Participants and Course Information

One hundred and three male and 194 female undergraduates enrolled in one of two chemistry courses involved in the Workshop Chemistry Program participated in the study. One of the courses utilized an absolute grading structure (n = 200), and the other used a normative grading structure (n = 97). Students' participation in the study was voluntary (61% of eligible individuals participated), and the mean age of participants was approximately 19.2 years old (ranging from 17 to ≥ 26). Approximately 65% of the sample was Caucasion, 14% Asian, and the remainder about an even distribution of African Americans, Latinos, and those designating themselves as "other."

Procedure

Assessments were administered at two different times during the semester. At Time 1 we assessed lecture engagement, evaluation focus, and harsh evaluation, along with students' achievement goals and competence valuation. SAT score information was also acquired at Time 1. As in Study 1, the Time 1 questionnaire was administered one to two classes before the first exam to ensure that students had been given the opportunity to form an impression of the classroom environment, but had not been influenced by any performance feedback. The perceived classroom environment measure was presented first, followed by several other measures applicable to a separate research project, and then the achievement goals measure was presented. At Time 2, participants completed a questionnaire assessing their intrinsic motivation for the course. This questionnaire was administered one to two lectures before the final exam in the course. Participants' final grades for the course were obtained from the professor at the end of the semester.

Measures

Perceived classroom environment. The same questionnaire used in Study 1 to assess lecture engagement, evaluation focus, and harsh evaluation was also used in this study.

Evaluation type. An evaluation type variable was created to represent the distinction between absolute and normative evaluative structures. The normative grading structure was coded −1, and the absolute grading structure was coded +1.

Achievement goals. As in Study 1, Elliot and Church's (1997) achievement goals questionnaire was used to assess students' mastery, performance-approach, and performance-avoidance goals for the course.

Competence valuation. A four-item scale was used to assess the extent to which students valued doing well in the class (e.g., "It is very important to me to do well in this class"). Participants responded to the items using a 1 (*completely false*) to 5 (*completely true*) scale. Similar competence valuation measures have been used in prior research on achievement goals and intrinsic motivation (see Harackiewicz & Manderlink, 1984).

SAT scores. Participants reported their verbal and math SAT scores on a 1 (*440 or lower*) to 10 (*800–770*) scale; these values were combined to form the SAT score variable.

Graded performance. Students' final grades for the course were used as the graded performance index.

Intrinsic motivation. Black and Deci's (1998) interest/enjoyment measure was used to assess participants' intrinsic motivation for chemistry. Participants responded to the items (e.g., "I enjoy learning about chemistry") using a 1 (*not at all/completely false*) to 5 (*very/completely true*) scale. Prior research has demonstrated the reliability and validity of this measure (see Black & Deci, 1998).

Results

Overview of Analyses

Multilevel modeling procedures are not appropriate for data in which only two cases (e.g., classes) are represented in the upper-level unit, thus we did not use HLM procedures in this study. Instead, we used three separate types of analyses: primary multiple regression analyses (described later), secondary multiple regression analyses in which all of the primary analyses were repeated within each class individually and the results combined meta-analytically using the Stoufer method (Rosenthal, 1978), and tertiary analyses in which the individual results from each class from the secondary analyses were examined for differences between classes using Rosenthal and Rosnow's (1984) approach.

In the primary analyses, we conducted two sets of simultaneous multiple regression analyses to test the classroom variables (the perceived classroom environment variables—lecture engagement, evaluation focus, and harsh evaluation—as well as evaluation type) as predictors of achievement goals (mastery, performance approach, and performance avoidance) and the outcome measures (graded performance and intrinsic motivation). In the first set of analyses, we tested each classroom variable as a separate predictor of each achievement goal and outcome variable. The main effects of competence valuation, SAT scores, and sex were also tested in preliminary analyses and retained when significant; whenever one of these covariates was retained in the equation, the Covariate × Classroom variable interactions (mean deviated) were also examined and retained when significant. In the second set of analyses, we took the regression models from the first set of analyses and combined them into a single analysis testing all of the classroom variables together as joint predictors of each achievement goal or outcome measure.

In the third set of analyses we examined the classroom variables and the achievement goal variables together as joint predictors of graded performance and intrinsic motivation. For each outcome measure, the model from the second set of analyses (testing all of the classroom variables together as joint predictors) was utilized with the achievement goal variables also included in the equation. The precise meaning of these analyses was determined by the results of the prior analyses. If, in the prior analyses, the classroom variables predicted achievement goals but had *no direct relationship* with the outcome measure, the analysis simply tested whether the classroom variables had an influence on the outcome measure by their influence on achievement goal adoption (see Pedhazer, 1982). If, in the prior analyses, the classroom variables predicted achievement goals and also had a *direct relationship* with the outcome measure, the analysis tested whether the achievement goal variables mediated the direct relationship observed (see Baron & Kenny, 1986). It is important to highlight that in both types of analysis the perceived classroom environment is conceptualized as exerting its influence by the achievement goal variables, meaning that in both types of analysis the perceived classroom environment

is tested as an *indirect* predictor of achievement outcomes. Descriptive statistics, reliabilities, and zero-order correlations for the primary variables in the study are presented in Table 2.

Perceived Classroom Variables as Predictors of Achievement Goals and Outcome Measures

Mastery goals. Testing each perceived classroom environment variable and evaluation type as an individual predictor of mastery goals revealed a significant positive relationship for lecture engagement, $F(1, 284) = 54.14$, $p < .0001$, ($\beta = .39$), and significant negative relationships for evaluation focus, $F(1, 292) = 22.62$, $p < .0001$, ($\beta = -.26$), and harsh evaluation, $F(1, 275) = 26.07$, $p < .0001$, ($\beta = -.29$). Competence valuation was also significantly positively related to mastery goal adoption in each analysis (βs ranged from .17 to .21, all ps $< .005$ at minimum); SAT scores were a significant positive predictor in the lecture engagement analysis only ($\beta = .11$, $p < .05$).

When the classroom variables were tested together as joint predictors of mastery goals, each of the perceived classroom variables was shown to be a significant predictor variable. Lecture engagement remained a significant positive predictor, $F(1, 271) = 45.00$, $p < .0001$, ($\beta = .37$); evaluation focus, $F(1, 271) = 4.93$, $p < .05$, ($\beta = -.13$), and harsh evaluation, $F(1, 271) = 14.96$, $p = .0001$ ($\beta = -.23$), remained significant negative predictors; and evaluation type became a significant positive predictor, $F(1, 271) = 16.70$, $p = .0001$, ($\beta = .23$). Competence valuation also remained significantly related to mastery goal adoption ($\beta = .18$, $p < .001$); SAT scores were unrelated.

Performance-approach goals. Testing each perceived classroom environment variable and evaluation type as an individual predictor of performance-approach goals revealed a significant positive relationship for evaluation focus, $F(1, 289) = 4.29$, $p < .05$, ($\beta = .11$). Competence valuation was also significantly positively related to performance-approach goal adoption in each analysis (βs ranged from .41 to .42, all ps $< .0001$). Sex was a significant negative predictor in each analysis (βs ranged from $-.17$ to $-.21$, all ps $< .005$ at minimum), indicating that male students were more likely to adopt performance-approach goals than female students. The interaction between harsh evaluation and competence valuation also attained significance ($\beta = -.11$, $p < .05$), and indicated that individuals with high competence valuation who did not view the evaluative structure as harsh were most likely to adopt performance-approach goals.

When the classroom variables were tested together as joint predictors of performance-approach goals, each of the relationships documented in the individual analyses remained significant. Evaluation focus remained a positive predictor, $F(1, 267) = 4.15$, $p < .05$, ($\beta = .12$), and competence valuation remained positively ($\beta = .42$, $p < .0001$), and sex negatively ($\beta = -.19$, $p < .001$), related to performance-approach goal adoption. The interaction between harsh evaluation and competence valuation also remained significant ($\beta = -.13$, $p < .05$).

Performance-avoidance goals. Testing each perceived classroom environment variable and evaluation type as an individual predictor of performance-avoidance goals revealed significant positive relationships for evaluation focus, $F(1, 282) = 10.92$, $p < .005$, ($\beta = .18$), harsh evaluation, $F(1, 266) = 22.92$, $p < .0001$, ($\beta = .27$), and, surprisingly, evaluation type, $F(1, 284) = 7.78$, $p < .01$, ($\beta = .17$). In each of the analyses, competence valuation was significantly positively related (βs ranged from .21 to .29, all ps $< .0001$), and SAT scores were significantly negatively related (βs ranged from $-.14$ to $-.22$, all ps $< .05$ at minimum) to performance-avoidance goal adoption.

When the classroom variables were tested together as joint predictors of performance-avoidance goals, evaluation focus was a marginally significant positive predictor, $F(1, 262) = 2.92$, $p < .09$, ($\beta = .11$), and harsh evaluation remained a significant positive predictor, $F(1, 262) = 10.12$, $p < .005$, ($\beta = .21$); evaluation type no longer attained significance. Competence valuation ($\beta = .24$, $p = .0001$) and SAT scores ($\beta = .21$, $p < .001$) remained significantly related to performance-avoidance goal adoption.

Graded performance. Testing each perceived classroom environment variable and evaluation type as an individual predictor of graded performance revealed no significant relationships for the classroom variables. SAT scores were significantly positively re-

Table 2
Study 2: Descriptive Statistics and Intercorrelations Among the Primary Variables

Variable	*M*	*SD*	Observed range	Reliability	Variable 1	2	3	4	5	6	7	8	9	10
1. Lecture engagement	19.16	5.26	4–28	.88	—									
2. Evaluation focus	5.83	2.50	3–14	.57	−.24**	—								
3. Harsh evaluation	13.58	3.97	4–28	.66	−.23**	.32**	—							
4. Competence valuation	17.89	2.40	9–20	.80	.12*	−.07	.02	—						
5. SAT scores	10.76	3.38	3–20	—	−.02	−.04	−.02	−.10	—					
6. Mastery goals	32.02	6.14	11–42	.86	.42**	−.27**	−.29**	.20**	.08	—				
7. Performance-approach goals	25.75	8.78	6–42	.88	.09	.11*	.00	.40**	.07	.15**	—			
8. Performance-avoidance goals	27.70	7.14	6–42	.73	−.04	.17**	.27**	.28**	−.19**	−.02	.23**	—		
9. Graded performance	2.74	1.07	0–4.3	—	.06	−.11*	−.10	.08	.32**	.18**	.11*	−.27**	—	
10. Intrinsic motivation	28.55	6.50	11–40	.93	.27**	−.23**	−.20**	−.05	.17*	.47**	.06	−.27**	.33**	—

Note. Dashes indicate that data were not applicable. SAT = Scholastic Aptitude Test.
* $p < .05$. ** $p < .01$.

lated to graded performance in each analysis (βs ranged from .30 to .33, all $ps < .0001$). Testing the classroom variables as joint predictors of graded performance yielded the same results: null findings for the classroom variables and a significant positive relationship for SAT scores ($\beta = .30$, $p < .0001$).

Intrinsic motivation. Testing each perceived classroom environment variable and evaluation type as an individual predictor of intrinsic motivation revealed a significant relationship for lecture engagement, evaluation focus, and harsh evaluation. Lecture engagement was a positive predictor of intrinsic motivation, $F(1, 193) = 20.44$, $p < .0001$, ($\beta = .31$); whereas evaluation focus, $F(1, 192) = 12.24$, $p < .001$, ($\beta = -.22$), and harsh evaluation, $F(1, 182) = 10.20$, $p < .005$, ($\beta = -.23$), were negative predictors. SAT scores were also significantly positively related to intrinsic motivation in each analysis (βs ranged from .16 to .18, all $ps \leq .05$). The interaction between evaluation focus and SAT scores also attained significance ($\beta = .15$, $p < .05$), and indicated that individuals with high SAT scores who did not view the professor as emphasizing evaluation were most likely to evidence a high degree of intrinsic motivation.

Testing the classroom variables together as joint predictors of intrinsic motivation revealed the following: lecture engagement remained a positive predictor, $F(1, 177) = 15.59$, $p = .0001$, ($\beta = .28$); evaluation focus was a marginally significant negative predictor, $F(1, 177) = 3.50$, $p = .06$, ($\beta = -.14$); harsh evaluation remained a significant negative predictor, $F(1, 177) = 6.15$, $p < .05$, ($\beta = -.19$); and evaluation type became a significant positive predictor, $F(1, 177) = 5.58$, $p < .01$, ($\beta = .22$). SAT scores were no longer a significant predictor, but the evaluation focus by SAT scores interaction did remain significant ($\beta = .16$, $p < .05$).

Perceived Classroom Environment Variables and Achievement Goals as Predictors of Outcomes

Graded performance. The previous analyses revealed that the perceived classroom environment variables influenced achievement goal adoption, but had no direct relationship with graded performance. It is possible, therefore, that the perceived classroom environment variables exerted an indirect influence on graded performance by their influence on achievement goal adoption. This possibility was examined by repeating the analysis conducted earlier (testing all of the classroom variables together as joint predictors of graded performance) with the achievement goals also included in the equation. This analysis again revealed null results for the classroom variables, but significant relationships for each of the achievement goal variables. Performance-approach goals were significant positive predictors of performance, $F(1, 262) = 5.32$, $p < .05$, ($\beta = .14$), as were mastery goals, $F(1, 262) = 9.14$, $p < .005$, ($\beta = .20$). Performance-avoidance goals were a significant negative predictor of performance, $F(1, 262) = 19.66$, $p < .0001$, ($\beta = -.28$). SAT scores were also positively related to performance ($\beta = .26$, $p < .001$). See Figure 1 for a pictorial summary of the primary results.

Intrinsic motivation. The previous analyses revealed that the perceived classroom environment variables influenced achievement goal adoption and also had a direct relationship with intrinsic motivation. It is possible, therefore, that the achievement goal variables served as *mediators* of the direct relationships between perceived classroom environment variables and intrinsic motivation. This possibility was examined by repeating the analysis conducted earlier (testing all of the classroom variables together as

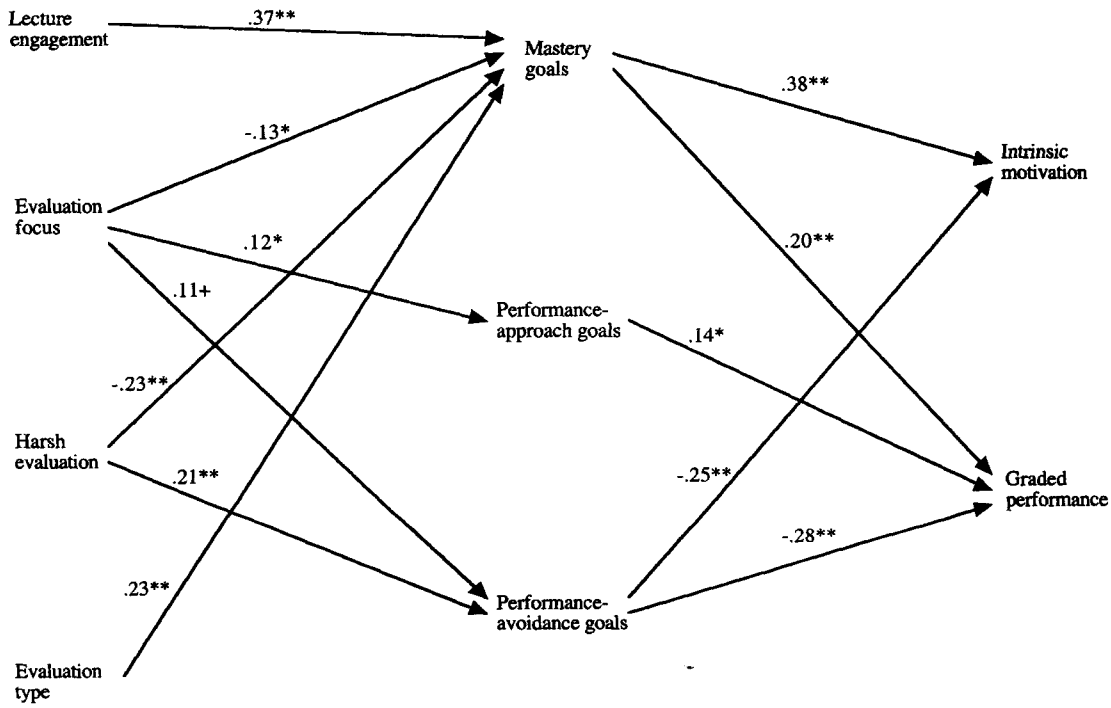

Figure 1. A summary of the results from the joint regression analyses. Path values are standardized regression coefficients, and only the theoretically central variables are included in the diagram for presentation clarity. $^{\dagger}p < .10$. $^{*}p < .05$. $^{**}p < .01$.

joint predictors of intrinsic motivation) with the achievement goals also included in the equation. This analysis yielded strong evidence that the achievement goals indeed mediated the direct relationships observed. Both mastery goals and performance-avoidance goals were significant predictors of intrinsic motivation; mastery goals were positive predictors, $F(1, 171) = 28.19$, $p < .0001$, ($\beta = .38$); and performance-avoidance goals were negative predictors, $F(1, 171) = 13.61$, $p < .0005$, ($\beta = -.25$). None of the perceived classroom environment variables remained significant with the achievement goal variables in the equation, and each of the direct relationships that had been documented evidenced a sizeable decrease: the beta for lecture engagement dropped from .28 to .13, the beta for evaluation focus dropped from −.14 to −.06, the beta for harsh evaluation dropped from −.19 to −.07, and the beta for the evaluation focus by SAT scores interaction dropped from .16 to .12. (In addition, the beta for evaluation type dropped from .22 to .14.) See Figure 1 for a pictorial summary of the primary results.[2]

Secondary and Tertiary Analyses

The set of (42) secondary analyses entailed repeating the aforementioned analyses within each class independently, and then combining the results by meta-analysis. The results from these analyses were nearly identical to those reported earlier. Each of the significant relationships in the individual analyses remained significant, and each of the nonsignificant results remained nonsignificant—with the exception of the relationship between evaluation focus and performance-avoidance goals (which had been significant and became $p = .059$). Each of the significant relationships in the joint analyses remained significant, and each of the nonsignificant results remained nonsignificant—with the exception of the relationship between evaluation focus and performance-approach goals (which had been significant and became $p = .085$), evaluation focus and performance-avoidance goals (which had been marginally significant and became $p = .11$), and evaluation focus and intrinsic motivation (which had been marginally significant and became $p = .165$).

The set of (42) tertiary analyses entailed testing for between-class differences in the results from the secondary analyses. These analyses revealed just two between-class differences: Although the relationship between lecture engagement and intrinsic motivation was evident in both classes, it was stronger in the class with the absolute grading structure ($\beta = .42$, $p < .0001$) than in the class with the normative grading structure ($\beta = .19$, $p = .145$); the relationship between lecture engagement and performance-avoidance goals was significantly different between the two classes, but the relationship was not significant in either class.

Discussion

The results of this study replicated and extended those obtained in Study 1. Lecture engagement was a positive predictor of mastery goal adoption, but was unrelated to the adoption of performance-approach or performance-avoidance goals. Evaluation focus was a positive predictor of both performance-approach and performance-avoidance goals and was negatively related to mastery goal adoption. Harsh evaluation was a positive predictor of performance-avoidance goals and a negative predictor of mastery goals, and was unrelated to performance-approach goals. These results represent a full replication of the Study 1 results and were obtained in both the individual and joint analyses. The examination of evaluation type as a predictor of the three achievement goals yielded less conclusive results. The use of absolute relative to normative standards positively predicted mastery goals in the joint, but not in individual, analyses and negatively predicted performance-avoidance goals in the individual, but not in joint, analyses. Evaluation type was unrelated to performance-approach goals in both analyses.

Analyses testing the perceived classroom environment variables as distal predictors and achievement goal variables as proximal predictors of graded performance and intrinsic motivation yielded results concordant with our predictions. None of the perceived classroom environment variables were documented as direct predictors of graded performance, but the perceived classroom environment variables did predict achievement goal adoption (as delineated in the previous paragraph), and these achievement goals, in turn, predicted graded performance. Specifically, performance-approach and, surprisingly, mastery goals were documented as positive predictors of graded performance, whereas performance-avoidance goals were negatively related to performance. Each of the perceived classroom environment variables exhibited a direct relationship with intrinsic motivation: lecture engagement and evaluation type displayed a positive relationship, and evaluation focus and harsh evaluation displayed a negative relationship. However, these relationships were all shown to be mediated by the achievement goal variables; specifically, the adoption of mastery goals, which then facilitated intrinsic motivation, and the adoption of performance-avoidance goals, which then proved inimical for intrinsic motivation. Thus, as hypothesized, the perceived classroom environment was shown to exert a distal influence on graded performance and intrinsic motivation, whereas achievement goals served as proximal predictors of these important achievement outcomes.

Meta-Analysis

Lecture engagement, evaluation focus, and harsh evaluation were examined as predictors of achievement goals in both studies, thereby affording a meta-analytic test of these relationships across the two studies. We conducted the meta-analyses using the Stouffer method; separate meta-analyses were conducted for the variables as individual and joint predictors. As displayed in Table 3, the results from both types of meta-analysis were nearly identical and provided additional confirmation of our predictions.

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[2] Following these analyses, structural equation modeling (SEM) analyses were also conducted to examine the fit of the final models to the data. The correlation matrix was used as input, and LISREL 8 (Jöreskog & Sörbom, 1993) generated a solution based on maximum-likelihood estimation. Each variable in the equation was represented by a unique observed indicator. The SEM analysis revealed that the final model for graded performance provided a satisfactory fit to the data, $\chi^2(16, N = 262) = 14.99$, $p > .05$, GFI (Goodness-of-Fit Index) = .99, AGFI (Adjusted Goodness-of-Fit Index) = .96, CFI (Comparative Fit Index) = 1.00, as did the final model for intrinsic motivation, $\chi^2(18, N = 171) = 16.18$, $p > .05$, GFI = .98, AGFI = .94, CFI = 1.00.

Table 3
Perceived Classroom Environment Variables as Predictors of Achievement Goals: Meta-Analytic Results

Analyses	Mastery goals		Performance-approach goals		Performance-avoidance goals	
	z	*p*	*z*	*p*	*z*	*p*
Individual analyses						
Lecture engagement	3.49	.0005	1.02	.31	−1.77	.07
Evaluation focus	−4.38	.00005	3.02	.005	3.89	.0005
Harsh evaluation	−4.37	.00005	1.04	.30	3.04	.005
Joint analyses						
Lecture engagement	3.14	.005	2.01	.05	1.17	.24
Evaluation focus	−2.27	.05	2.94	.005	2.23	.05
Harsh evaluation	−4.18	.00005	0.42	.67	3.25	.005

Note. The *z* values were obtained by using the Stouffer method (Rosenthal, 1978).

General Discussion

Two studies were conducted in the present research to examine the relationship between undergraduates' perceptions of their classroom environment, their adoption of achievement goals for the course, and their graded performance in the course and intrinsic motivation for the course material. The results from the two studies were highly consistent with each other and with our hypotheses. Each of the three achievement goals in the trichotomous framework evidenced a distinct antecedent profile: mastery goal adoption was linked to lecture engagement and the absence of an evaluation focus and harsh evaluation, performance-approach goal adoption was linked to evaluation focus, and performance-avoidance goal adoption was linked to evaluation focus and harsh evaluation. When the perceived classroom environment and achievement goal variables were tested together as predictors of graded performance and intrinsic motivation, the results clearly demonstrated that the influence of the perceived classroom environment on these outcomes measures was indirect; the perceived classroom environment influenced achievement goal adoption, and achievement goal adoption, in turn, directly influenced graded performance and intrinsic motivation. All of these relationships were observed controlling for sex, competence valuation, and SAT scores.

These results add to the growing body of work attesting to the need to attend to the approach-avoidance, as well to as the mastery-performance, distinction in the achievement goal literature. Performance-approach and performance-avoidance goals not only led to differential outcomes, as demonstrated in prior research, but they also emerged from a distinct pattern of antecedents. That is, although a perceived emphasis on evaluation in the classroom influenced the adoption of performance goals in general, the perceived stringency or harshness of the evaluation uniquely predicted performance-avoidance goal adoption. Collapsing across the two types of performance goals (i.e., utilizing the mastery/performance goal dichotomy) would likely have led to the conclusion that perceived harsh evaluation leads to the adoption of performance goals in general, a conclusion that clearly obscures important information.

Harsh evaluation proved to be a particularly inimical characteristic of the perceived classroom environment in that it not only impelled students to adopt performance-avoidance goals, but it also inhibited their tendency to adopt mastery goals. Fear of failure represents a motive disposition that has also been linked to performance-avoidance goal adoption (Elliot & Church, 1997; Elliot & McGregor, 1999), and, interestingly, research has shown that individuals high in fear of failure tend to evaluate their behavior in a harsh, tyrannical manner (Solomon & Rothblum, 1984). Thus, it seems that stringent evaluative standards, whether their locus be the perceived environment or the self per se, represent a risk factor in the achievement domain, in that they lead to the adoption of performance-avoidance goals and may even inhibit mastery goal adoption. It will be important for future research to focus on how variables such as harsh evaluation or evaluation focus, and dispositional variables such as fear of failure or need for achievement, combine or interact to produce achievement goal adoption. For example, evaluation focus may lead to performance-approach goals for those high in need for achievement but may evoke performance-avoidance goals for those high in fear of failure.

The present research focused on individual, rather than composite, indicators of the perceived classroom structure, and we believe there is much to value in this fine grained approach. One obvious benefit is that it affords precise information regarding the specific aspects of the perceived classroom environment that contribute to the process of goal adoption. In addition, Ames (1992) has discussed the fact that some classrooms possess unique combinations of both mastery- and performance-oriented characteristics, and it would seem optimal to assess the various aspects of the perceived classroom structure individually in such instances. Nevertheless, composite measures of perceived classroom goal structures have been shown to be internally consistent, and composite indicators yield a more comprehensive assessment of the perceived classroom environment than do individual indicators. As such, although the present research illustrates the benefits of focusing on individual characteristics of the perceived classroom environment, clearly composite measures are also valuable, and the two assessment approaches should be viewed as complementary.

This contrast of individual and composite approaches to assessing the perceived classroom structure makes salient two important avenues for future research in this area. First, and high on the research agenda, is the need to identify additional perceived class-

room characteristics that prompt the adoption of performance-avoidance as opposed to performance-approach (and mastery) goals. Noteworthy candidates include the degree to which the teacher criticizes or shames students when they make a mistake, the degree to which the teacher models shame on making a mistake, and the degree to which teachers communicate negative expectancies to their students. These variables—like harsh evaluation and, at the dispositional level, fear of failure—are presumed to orient students toward the possibility or ramifications of failure, thereby increasing the likelihood of performance-avoidance goal adoption.

Second, extant composite indicators of the perceived classroom/school-wide performance goal structure do not distinguish characteristics that stress performance-approach goals from those that stress performance-avoidance goals. Many such measures not only represent a compilation of specific characteristics, they also represent an amalgam of negatively focused items ("Our teacher makes it obvious when certain students aren't doing well on their work"), positively focused items ("Our teacher often calls on smart students"), and items that are neutral in valence (e.g., "Our teachers tell us how we compare to others"; see Ames & Archer, 1988; L. Anderman & E. Anderman, 1999; Midgley et al., 1995). Researchers using the dichotomous framework have drawn a conceptual parallel between achievement goals at the personal level and achievement goals at the structural level, and it seems reasonable to consider an analogous parallel when using the trichotomous framework. That is, it may be useful to develop differentiated measures of performance goals at the structural, as well as at the personal, level to represent the distinction between environments that focus on positive possibilities (performance approach) and those that focus on negative possibilities (performance avoidance). A performance-neutral goal (see Elliot & Harackiewicz, 1996) may also be worthy of attention at the structural level because classroom/school-wide environments often seem to emphasize normative evaluation and outcomes without highlighting a particular valence. The impact of performance-neutral goals on achievement goal adoption would undoubtedly be greatly influenced (moderated) by various intrapsychic factors such as motive dispositions and competence expectancies.

We assessed competence valuation in Study 2, primarily to test our goal adoption hypotheses with added rigor. However, examination of the associations obtained between competence valuation and the achievement goal variables revealed a pattern that is itself interesting: Competence valuation was positively associated with each of the three achievement goals in both the individual and joint analyses. These relationships suggest that mastery, performance-approach, and performance-avoidance goals are *quantitatively* similar in that they all represent a commitment to competence-based striving; it is in their *qualitative* nature (how competence is both defined and valenced) that they differ. (These goals may be contrasted with work avoidance goals that represent the absence of an investment in competence.) Thus, competence valuation may be construed as an undifferentiated antecedent of achievement goals (see Wigfield & Eccles, 1992), essentially representing the presence of competence-based motivation that gets channelled into differentiated forms by the goal adoption process.

No consistent findings (across the individual and joint analyses) were revealed for evaluation type as a predictor of achievement goals. This fact, coupled with the clear and consistent findings for evaluation focus and harsh evaluation, suggests that the type of referent used in the evaluation process may be less important for goal adoption than the degree of emphasis on evaluation and the stringency of that evaluation. Evaluation type also yielded null findings when tested as a predictor of graded performance (consistent with previous research with undergraduates; see Williams, Pollack, & Ferguson, 1975), but did predict intrinsic motivation—the absolute grading structure was positively related to intrinsic motivation. We should note that classroom instructor was not held constant across evaluation type, thus making it possible that evaluation type was confounded with other variables. It is important for future research to investigate the robustness of these findings across grade levels. It is possible that by their undergraduate years, students have adjusted to normative grading structures to some degree, but that younger students are deeply affected by the type, as well as salience and stringency, of evaluation in the classroom. It is also possible that it is primarily those individuals who have successfully adjusted to normative grading structures that end up matriculating at the university level.

One surprising finding in the present research was that mastery goals were shown to be positive predictors of graded performance. Although some previous studies have revealed such a relationship, the literature is highly inconsistent and the modal result, particularly in research with undergraduates, is that mastery goals are unrelated to performance outcomes (see Elliot & Church, 1997; Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997). The reason for the positive relationship between mastery goals and performance in our research may lie in the fact that the study was conducted in classrooms taking part in a program designed to help maintain student interest and enrollment. It seems likely that professors in such a program would create a more mastery-oriented learning environment than the average professor, an environment in which mastery goal pursuit would undoubtedly yield maximal benefits. Clearly the issue of what enhances the link between mastery goals and performance attainment is in need of research attention.

Most research examining the relationship between classroom/school-wide structures and student motivation has relied on student perception data, and the present research is no exception. Although it is clear that the "functional significance" of the educational environment for students is of critical importance (Ames, 1992; R. Ryan & Grolnick, 1986), some researchers have begun to emphasize or demonstrate the value of attending to additional sources of information such as teacher perception data or observational data (Meece, 1991; A. Ryan, Gheen, & Midgley, 1998; Urdan, Midgley, & Anderman, 1998). From this standpoint, the exclusive reliance on self-perception data in the present studies is a limitation, and in future research it would be optimal to utilize multiple methodologies to assess the educational environment. Such an approach should shed additional light on the extent to which student perceptions reflect actual features of the classroom and school environment versus underlying dispositions or propensities within the individual (see Urdan, 1997, for an excellent discussion of this issue), information that has clear implications for the focus of intervention efforts.

The working assumption in the present research, and in the literature more broadly, is that there exists at least some degree of concordance between subjective perceptions and actual features of the achievement environment. Accordingly, our results suggest the

need for educators to attend to the degree to which they present their material in an engaging manner, the extent to which they emphasize evaluation, and the stringency of their evaluative practices. Harsh evaluation may not only be the most important issue to attend to (as discussed earlier), but also the easiest to address. Some instructors may be limited in their ability to present material in an engaging way, and in some environments (particularly in advanced academic settings) it may be extremely difficult to downplay the importance of evaluation. However, it seems that for most instructors and in most environments, increasing students' opportunities to acquire a positive evaluation (e.g., by increasing the range of A and B grades in a normative curve) is a rather straightforward proposition.

The fact that some of the data from the present studies were collected concurrently and that all of the analyses were correlational in nature is also a limitation, in that such data do not allow definitive causal statements to be made with regard to the relationships observed. For example, it is possible that students' achievement goals actually influence their perceptions of the classroom environment, rather than the reciprocal as we have proposed. Our data are clearly consistent with and nicely fit the view that perceptions of the classroom environment lead to achievement goal adoption and that achievement goals lead to performance and intrinsic motivation. However, experimental manipulation of the classroom environment and achievement goals would be necessary (in a series independent experiments) to document the directionality of these relationships with certitude.

A central aim of the present research was to investigate the role of achievement goals as intervening variables in the relationship between the perceived classroom environment and achievement outcomes. Our results demonstrated that achievement goals indeed serve this role and that an "intervening variable" can take on two different meanings: (a) intermediate step in a sequential path (the graded performance results), and (b) explanatory variable that accounts for a direct relationship (the intrinsic motivation results). In both instances, achievement goals serve the role of proximal predictor of achievement outcomes, thereby highlighting the prominent place of the achievement goal construct in models of motivated achievement behavior.

In establishing achievement goals as an intervening variable, we brought together several research questions that are commonly discussed and investigated in isolation: the relationship between perceived educational environments and achievement outcomes, the relationship between perceived educational environments and achievement goals, and the relationship between achievement goals and achievement outcomes (see also Midgley et al., 1995; Roeser et al., 1996). In addition, documenting perceived classroom environment variables as antecedents of mastery, performance-approach, and performance-avoidance goal adoption extends our hierarchical model of achievement motivation (Elliot & Church, 1997). In the past few years, achievement goal research appears to have moved from a predominant focus on bivariate associations (see Dweck, 1990, for an important exception) toward a more complex integration of multiple constructs within a broader conceptual framework (see E. Anderman & Maehr, 1994; Greene & Miller, 1996; Harackiewicz et al., 1997; Newman, 1998; Nolen & Haladyna, 1990; Roeser et al., 1996; Ryan & Pintrich, 1997; Turner, Thorpe, & Meyer, 1998). This seems a welcome development as the achievement goal literature enters its third decade, one reflecting the vitality and maturation of this influential approach to competence-based motivation.

References

Ames, C. (1992). Classrooms: Goals, structures, and student motivation. *Journal of Educational Psychology, 84,* 261–271.

Ames, C., & Archer, J. (1988). Achievement goals in the classroom: Student learning strategies and motivation processes. *Journal of Educational Psychology, 80,* 260–267.

Anderman, E., & Maehr, M. (1994). Motivation and schooling in the middle grades. *Review of Educational Research, 64,* 287–310.

Anderman, E., & Midgley, C. (1997). Changes in achievement goal orientations, perceived academic competence, and grades across the transition to middle level schools. *Contemporary Educational Psychology, 22,* 269–298.

Anderman, E., & Young, A. (1994). Motivation and strategy use in science: Individual differences and classroom effects. *Journal of Research in Science Teaching, 31,* 811–831.

Anderman, L., & Anderman, E. (1999). Social predictors of changes in students' achievement goal orientations. *Contemporary Educational Psychology, 25,* 21–37.

Baron, R., & Kenny, D. (1986). The moderator–mediator variable distinction in social psychological research. *Journal of Personality and Social Psychology, 51,* 1173–1182.

Black, A., & Deci, E. (1998). *The effects of student self-regulation and instructor autonomy support on learning in a college-level natural science course: A self-determination theory perspective.* Manuscript submitted for publication.

Brophy, J. (1986). Teacher influences on student achievement. *American Psychologist, 41,* 1069–1077.

Bryk, A., & Raudenbush, S. (1992). *Hierarchical linear models: Applications and data-analysis methods.* Beverly Hills, CA: Sage.

Dweck, C. (1986). Motivational processes affecting learning. *American Psychologist, 41,* 1040–1048.

Dweck, C. (1990). Self-theories and goals: Their role in motivation, personality, and development. In R. Dienstbier (Ed.), *Nebraska symposium on motivation* (Vol. 38, pp. 199–235). Lincoln: University of Nebraska Press.

Elliot, A. (1997). Integrating the "classic" and "contemporary" approaches to achievement motivation: A hierarchical model of approach and avoidance achievement motivation. In M. Maehr & P. Pintrich (Eds.), *Advances in motivation and achievement* (pp. 143–179). Greenwich, CT: JAI.

Elliot, A. (1999). Approach and avoidance motivation and achievement goals. *Educational Psychologist, 34,* 149–169.

Elliot, A., & Church, M. (1997). A hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology, 72,* 218–232.

Elliot, A., & Harackiewicz, J. (1996). Approach and avoidance achievement goals and intrinsic motivation: A mediational analysis. *Journal of Personality and Social Psychology, 70,* 461–475.

Elliot, A., & McGregor, H. (1999). Test anxiety and the hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology, 76,* 628–644.

Elliot, A., McGregor, H., & Gable, S. (1999). Achievement goals, study strategies, and exam performance: A mediational analysis. *Journal of Educational Psychology, 91,* 549–563.

Epstein, J. (1988). Effective schools or effective students: Dealing with diversity. In R. Haskins & D. MacRae (Eds.), *Policies for America's public schools* (pp. 89–126). Norwood, NJ: Ablex.

Frasier, B., & Fisher, D. (1986). Using short forms of classroom climate instruments to assess and improve classroom psychosocial environment. *Journal of Research in Science Teaching, 23,* 387–413.

Gosser, D., Roth, V., Gafney, L., Kampmeier, J., Strozak, V., Varma-Nelson, P., Radel, S., & Weiner, M. (1996). Workshop chemistry: Overcoming the barriers to student success. *The Chemical Educator, 1,* Retrieved from the World Wide Web: http://journals.springer.ny.com/chedr.

Greene, B., & Miller, R. (1996). Influences on achievement: Goals, perceived ability and cognitive engagement. *Contemporary Educational Psychology, 21,* 181–192.

Harackiewicz, J., Barron, K., Carter, S., Lehto, A., & Elliot, A. (1997). Predictors and consequences of achievement goals in the college classroom: Maintaining interest and making the grade. *Journal of Personality and Social Psychology, 73,* 1284–1295.

Harackiewicz, J., Barron, K., & Elliot, A. (1998). Rethinking achievement goals: When are they adaptive for college students and why? *Educational Psychologist, 33,* 1–21.

Harackiewicz, J., & Manderlink, G. (1984). A process analysis of the effects of performance-contingent reward on intrinsic motivation. *Journal of Experimental Social Psychology, 20,* 531–551.

Jöreskog, K., & Sörbom, D. (1996). *LISREL 8 user's guide.* Chicago: Scientific Software.

Maehr, M., & Midgley, C. (1991). Enhancing student motivation: A school-wide approach. *Educational Psychologist, 26,* 399–427.

Meece, J. (1991). The classroom context and children's motivational goals. In M. Maehr & P. Pintrich (Eds.), *Advances in achievement motivation research* (pp. 261–286). Greenwich, CT: JAI.

Middleton, M., & Midgley, C. (1997). Avoiding the demonstration of lack of ability: An underexplored aspect of goal theory. *Journal of Educational Psychology, 89,* 710–718.

Midgley, C., Anderman, E., & Hicks, L. (1995). Differences between elementary and middle school teachers and students: A goal theory approach. *Journal of Early Adolescence, 15,* 90–115.

Newman, R. (1998). Students' help-seeking during problem solving: Influences of personal and environmental goals. *Journal of Educational Psychology, 90,* 644–658.

Nicholls, J. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review, 91,* 328–346.

Nolen, S., & Haladyna, T. (1990). Personal and environmental influences on students' beliefs about effective study strategies. *Contemporary Educational Psychology, 15,* 116–130.

Pedhazer, E. (1982). *Multiple regression in behavioral research: Exploration and prediction* (2nd ed.). Fort Worth, TX: Holt, Rinehart, and Winston.

Pintrich, P. (1999). The role of goal orientation in self-regulated learning. In M. Boekaerts, P. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation: Theory, research, and applications* (pp. 451–502). San Diego, CA: Academic Press.

Pintrich, P., Roeser, R., & DeGroot, E. (1994). Classroom and individual differences in early adolescents motivation and self-regulated learning. *Journal of Early Adolescence, 14,* 139–161.

Rawsthorne, L., & Elliot, A. (1999). A meta-analysis of the relationships between achievement goals and intrinsic motivation. *Personality and Social Psychgology Review, 3,* 326–344.

Roeser, R., Midgley, C., & Urdan, T. (1996). Perceptions of the school psychological environment and early adolescents' self-appraisal and academic engagement: The mediating role of goals and belonging. *Journal of Educational Psychology, 88,* 408–422.

Rosenthal, R. (1978). Combining results of independent studies. *Psychological Bulletin, 85,* 185–193.

Rosenthal, R., & Rosnow, R. (1984). *Essentials of behavioral research: Methods and data analysis.* New York: McGraw Hill.

Ryan, A., Gheen, M., & Midgley, C. (1998). Why do some students avoid asking for help? An examination of the interplay among students' academic efficacy, teachers' social–emotional role, and classroom goal structure. *Journal of Educational Psychology, 90,* 528–535.

Ryan, A., & Pintrich, P. (1997). Should I ask for help? The role of motivation and attitudes in adolescents' help-seeking in math class. *Journal of Educational Psychology, 89,* 329–341.

Ryan, R., & Grolnick, W. (1986). Origins and pawns in the classroom: Self-report and projective assessments of individual differences in children's perceptions. *Journal of Personality and Social Psychology, 50,* 550–558.

Skaalvick, E. (1997). Self-enhancing and self-defeating ego orientation: Relations with task and avoidance orientation, achievement, self-perceptions, and anxiety. *Journal of Educational Psychology, 89,* 71–81.

Solomon, L., & Rothblum, E. (1984). Academic procrastination: Frequency and cognitive–behavioral correlates. *Journal of Consulting Psychology, 31,* 503–509.

Stipek, D. (1996). Motivation and instruction. In D. Berliner & R. Calfee (Eds.), *Handbook of educational psychology* (pp. 85–113). New York: MacMillan.

Turner, J., Thorpe, P., & Meyer, D. (1998). Students' reports of motivation and negative affect: A theoretical and empirical analysis. *Journal of Educational Psychology, 90,* 758–771.

Urdan, T. (1997). Achievement goal theory: Past results, future directions. In P. Pintrich & M. Maehr (Eds.), *Advances in motivation and achievement* (pp. 99–142). Greenwich, CT: JAI.

Urdan, T., Midgley, C., & Anderman, E. (1998). The role of classroom goal structure in students' use of self-handicapping. *American Educational Research Journal, 35,* 101–122.

Vandewalle, D. (1997). Development and validation of a work domain goal orientation instrument. *Educational and Psychological Measurement, 57,* 995–1015.

Wigfield, A., & Eccles, J. (1992). The development of achievement task values: A theoretical analysis. *Developmental Review, 12,* 265–310.

Williams, R., Pollack, M., & Ferguson, N. (1975). Differential effects of two grading systems on student performance. *Journal of Educational Psychology, 67,* 253–258.

Winston, R., Vahala, M., Nichols, E., Gillis, M., Winthrow, M., & Rome, K. (1994). A measure of college classroom climate. *Journal of College Student Development, 35,* 11–18.

Young, A. (1997). I think therefore I'm motivated: The relations among cognitive strategy use, motivational orientation and classroom perceptions over time. *Learning and Individual Differences, 9,* 249–283.

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